

# **ORANGEVILLE**

***water pollution  
control plant***

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET, TORONTO 5  
OFFICE OF THE GENERAL MANAGER

Members of the Orangeville Local Advisory Committee,  
Town of Orangeville.

Gentlemen;

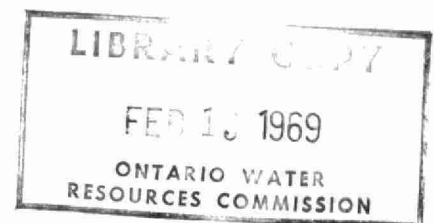
We are happy to present you with the 1967 Operating Summary for the  
Orangeville Water Pollution Control Plant, OWRC Project No. 2-0016-58.

Your co-operation with our staff throughout the year has been appreciated.  
Only with such co-operation can the war against water pollution be waged  
effectively.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,  
General Manager.





ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET  
TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY  
GENERAL MANAGER

W. S. MACDONNELL  
COMMISSION SECRETARY

General Manager,  
Ontario Water Resources Commission.

Dear Sir;

I am pleased to submit to you the 1967 Operating Summary for the Orangeville Water Pollution Control Plant, OWRC Project No. 2-0016-58.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in cursive script, reading "D. A. McTavish".

D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

## FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

## **C O N T E N T S**

Foreword . . . . .	1
Title Page . . . . .	3
'67 Review . . . . .	4
Project Costs . . . . .	5
Operating Costs . . . . .	6
Process Data . . . . .	10
Conclusions . . . . .	Inside back cover

**ORANGEVILLE**  
**water pollution control plant**

operated for

THE TOWN OF ORANGEVILLE

by the

ONTARIO WATER RESOURCES COMMISSION

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DIVISION OF PLANT OPERATIONS

DIRECTOR: D. A. McTavish

Assistant Director: C. W. Perry  
Regional Supervisor: A. C. Beattie  
Operations Engineer: A. Clark

801 Bay Street    Toronto 5

## **'67 REVIEW**

Although the plant is well run the quality of the effluent was poor. The average final effluent was 70 ppm BOD and 69 ppm SS which far exceeds Commission objectives of 15 ppm BOD and 15 ppm SS respectively.

A chlorine residual of 1.0 ppm is maintained in the final effluent to ensure complete disinfection.

The sewer maintenance program carried out by the municipal works department resulted in a reduction in the amount of grit conveyed to the plant.

The plant is operated eight hours per day, five days a week. Part of the weekend supervision is supplied by municipal staff.

During the past year there were routine inspections by the Operations Engineer and his assistant. Inspections were also made by the Safety Officer, the maintenance section and the special services section.

Late in 1967 work was begun on the expansion of existing facilities. The secondary treatment section was removed from service in order to dewater the area prior to the commencement of construction.



## PROJECT COSTS

NET CAPITAL COST (Estimated)	
Long Term Debt to OWRC	\$176,332.46
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	\$ 33,066.82
Debt Retirement	\$ 3,558.00
Reserve	869.91
Interest Charged	9,803.00
Net Operating	15,203.20
TOTAL	\$ 29,434.11

### RESERVE ACCOUNT

Balance at January 1, 1967	\$ 7,730.22
Deposited by Municipality	869.91
Interest Earned	457.44
	\$ 9,057.57
Less Expenditures	-
Balance at December 31, 1967	\$ 9,057.57

## MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY
JAN	1,073.61	423.91	-	238.90	141.75	19.05		-	250.00
FEB	1,099.08	459.03	25.09	159.86	141.75	44.99		5.86	262.50
MARCH	1,346.87	682.16	24.67	(46.03)	141.75	80.19		164.54	299.59
APRIL	1,187.88	466.80	-	127.87	141.75	17.86		169.63	263.97
MAY	218.71	459.37	-	(807.61)	283.50	37.29		187.40	58.76
JUNE	1,690.25	485.13	-	1,057.39	-	40.17	(156.30)	-	263.86
JULY	1,379.34	434.46	74.26	130.50	336.42	7.58	-	51.29	344.83
AUG	871.54	522.29	-	133.70	141.75	36.40	-	9.54	27.86
SEPT	1,534.33	706.11	-	107.95	-	40.68	-	127.26	552.33
OCT	1,450.89	439.56	-	131.72	478.17	6.50	56.00	90.13	246.81
NOV	1,313.12	491.29	25.42	100.13	141.75	34.63	-	18.85	501.05
DEC	2,037.58	468.58	49.58	144.78	370.13	42.61	131.35	30.45	800.10
TOTAL	15,203.20	6,030.69	199.02	1,479.16	2,318.72	407.95	31.05	854.95	3873.66

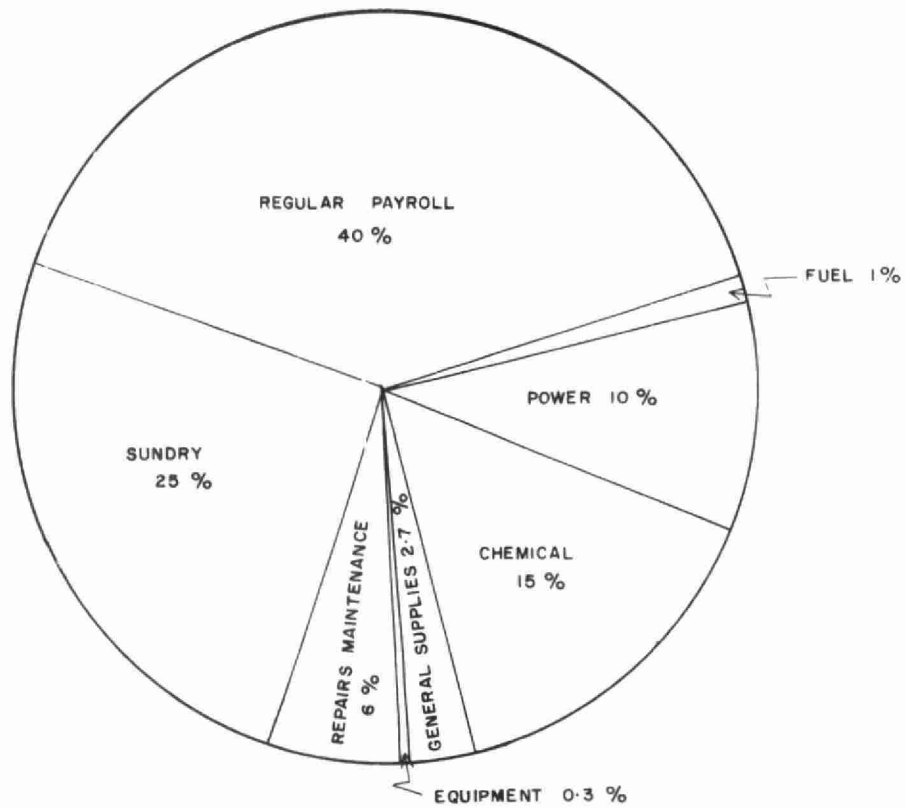
\* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$1,775.00

BRACKETS INDICATE CREDIT

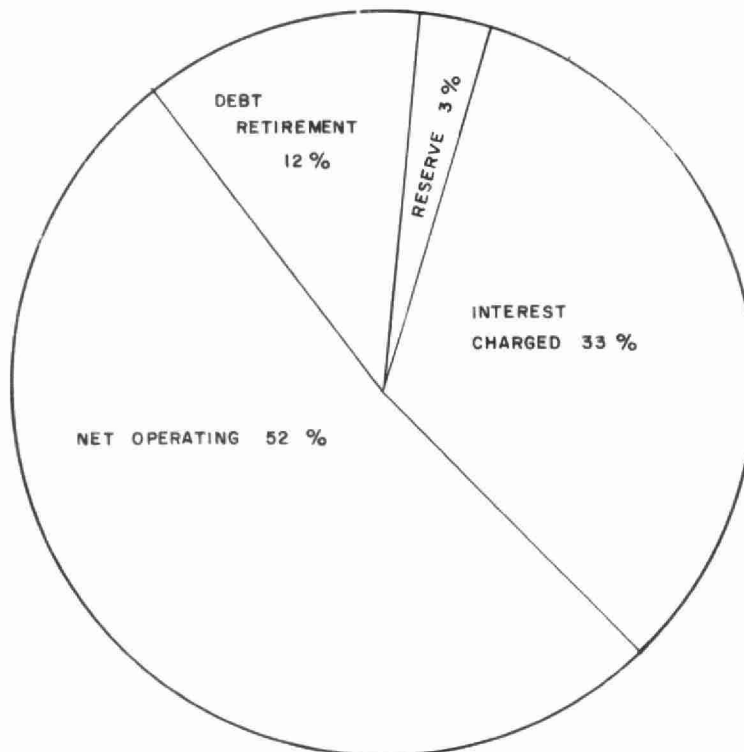
## YEARLY OPERATING COSTS

YEAR	M. G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1961	168,643	\$ 12992.61	\$ 77.00	
1962	161,630	\$ 10616.07	\$ 65.80	4 CENTS
1963	161,545	\$ 13347.87	\$ 82.60	7 CENTS
1964	187,373	\$ 13000.89	\$ 69.38	8 CENTS
1965	215,853	\$ 13525.19	\$ 62.66	6 CENTS
1966	209,502	\$ 14956.60	\$ 71.39	7 CENTS
1967	240,618	\$ 15203.20	\$ 63.18	9 CENTS

## 1967 OPERATING COSTS



## TOTAL ANNUAL COST



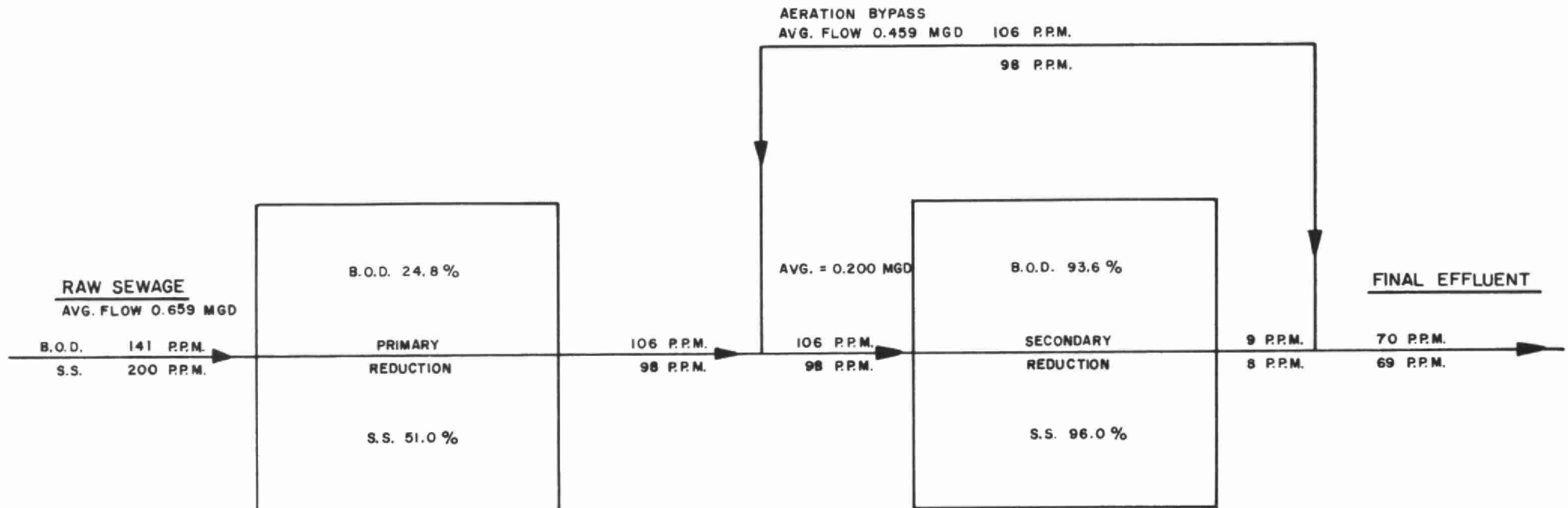
## Process Data

The average daily flow for 1967 was 0.659 mgd, an increase of 14.4% from 1966.

Since only 0.16 mgd received full treatment, the result of the increased flow was a decrease in overall plant efficiency particularly in BOD removal. The average BOD and SS in the final effluent was 70 and 60 ppm respectively.

The secondary treatment section was removed from service in late November due to the construction of the plant enlargement.

ORANGEVILLE W.P.C.P.  
SCHEMATIC SKETCH SHOWING EFFICIENCIES  
OBTAINED BY PRIMARY & SECONDARY UNITS

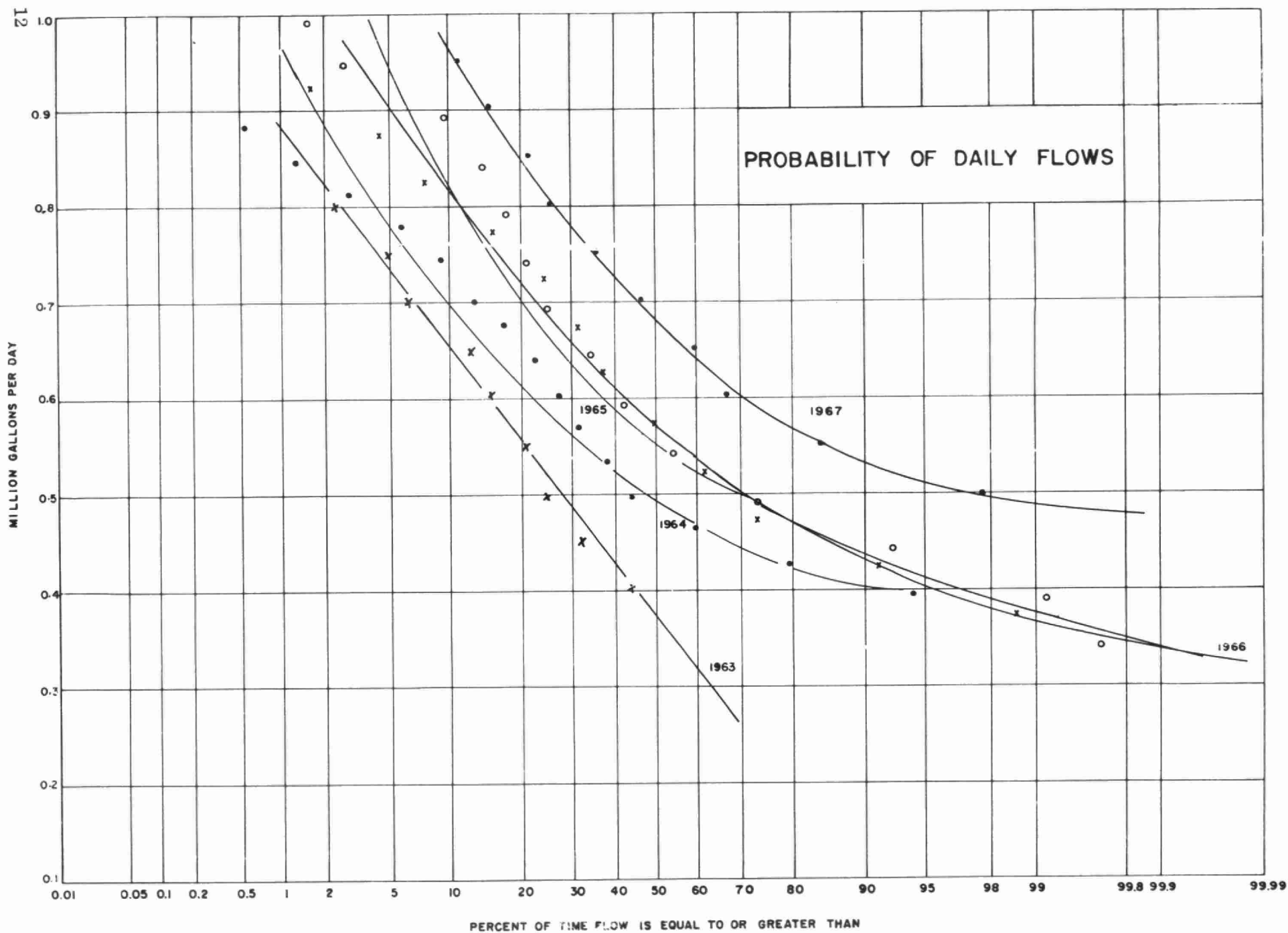


NOTE: OVERALL PLANT EFFICIENCY

B.O.D. = 50.1 %  
S.S. = 60.3 %

ABOVE LOADINGS BASED ON AVERAGE OF SAMPLE RESULTS FOR 1967

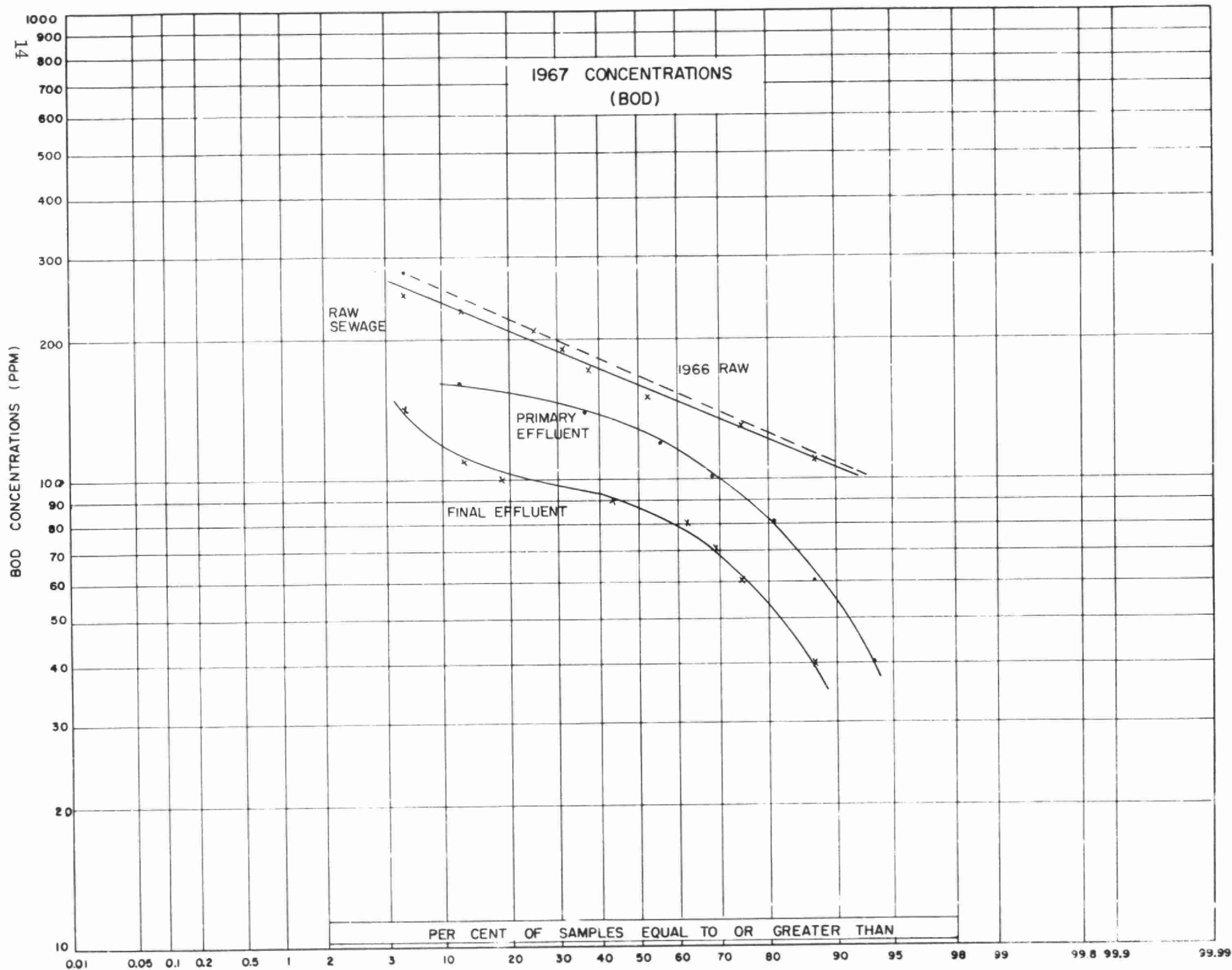
B.O.D. — RAW SEWAGE 141 P.P.M.  
S.S. — RAW SEWAGE 200 P.P.M.



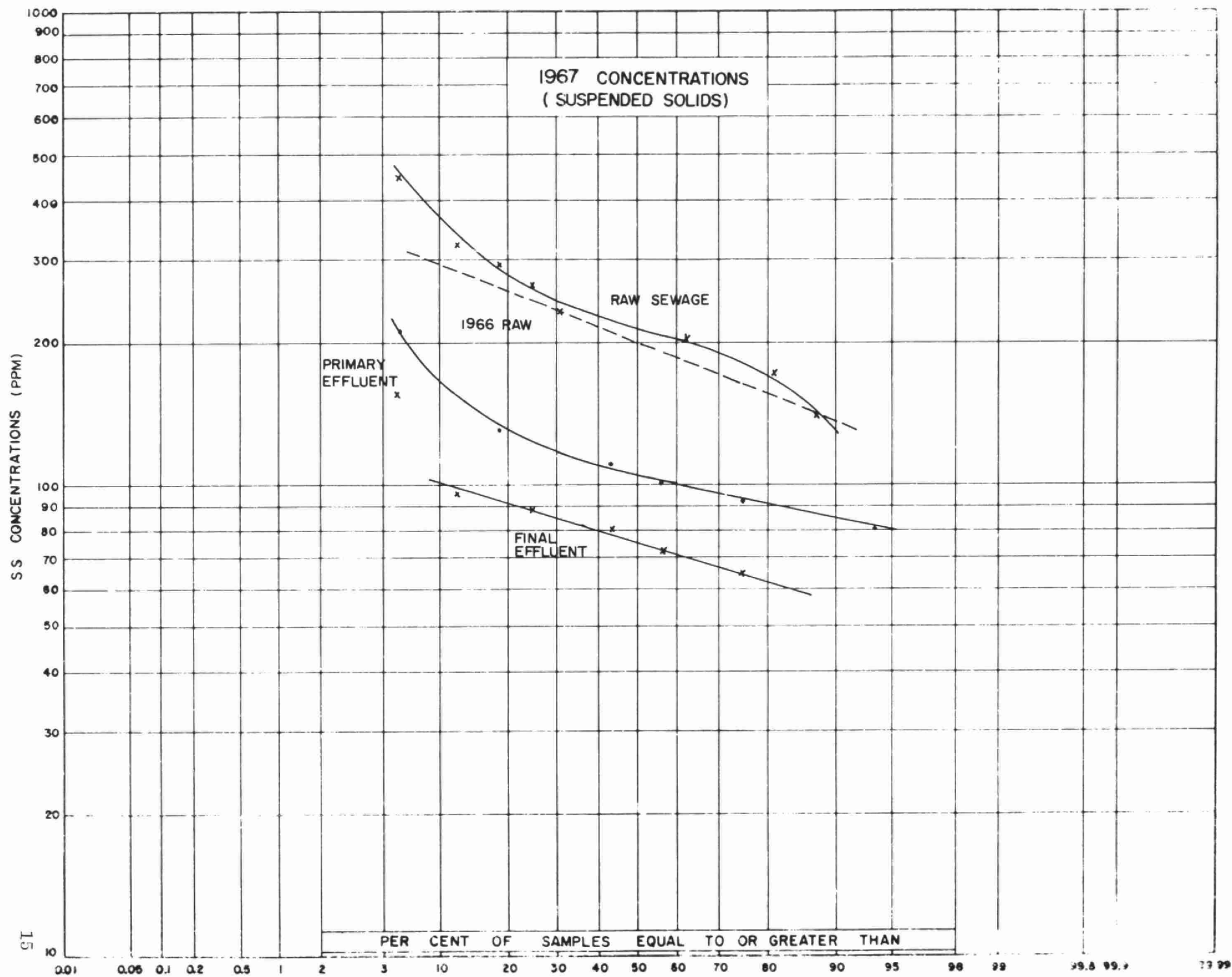
M.G.D.

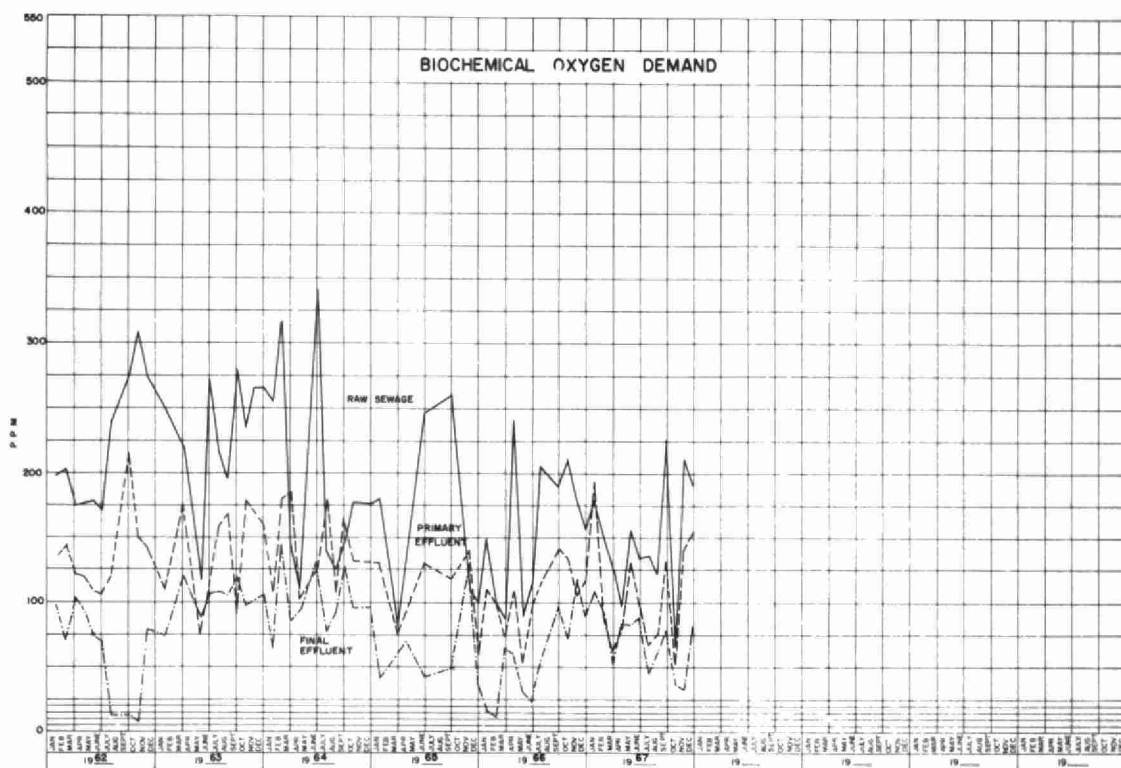
# AVERAGE DAILY FLOW

JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 19 61  
 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 19 62  
 JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC 19 63  
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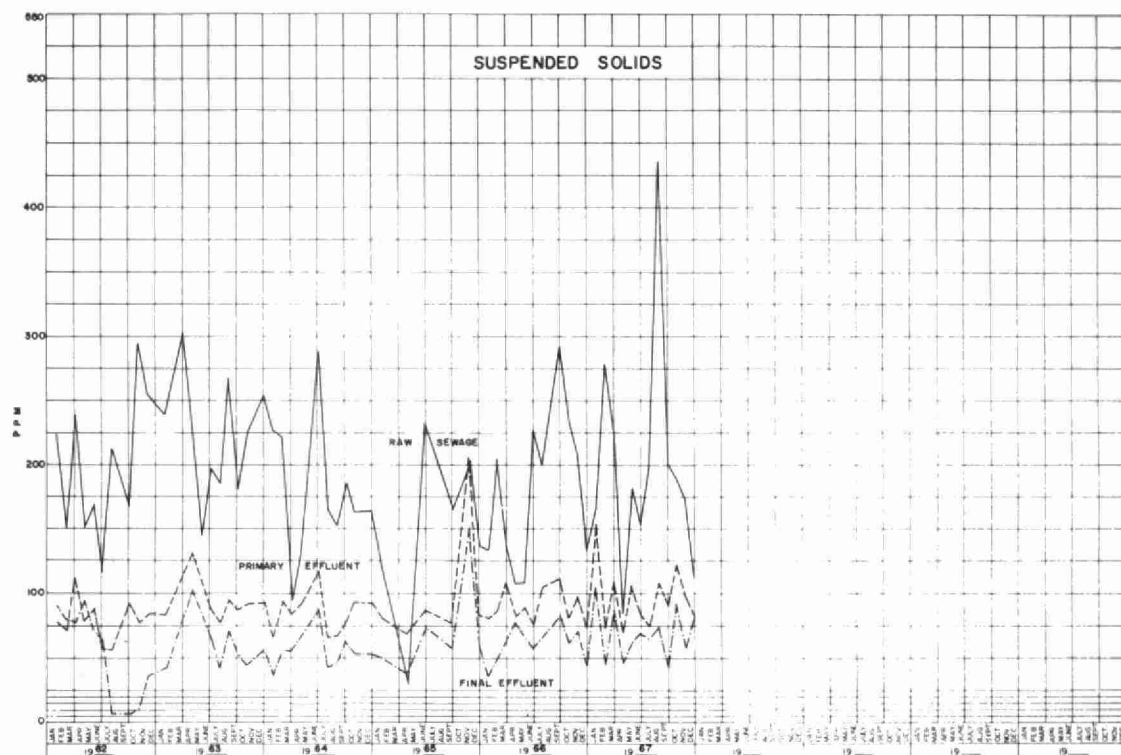








## MONTHLY VARIATIONS



## GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	179	109	39.1	6.44	166	104	37.3	5.70	-
FEB.	150	92	38.7	4.88	278	46	83.4	19.51	-
MAR.	129	53	58.9	8.24	227	87	61.7	17.17	-
APR.	97	83	14.4	1.86	84	46	45.2	5.06	40
MAY	156	83	46.8	7.02	183	62	66.1	11.63	-
JUNE	134	88	34.3	4.54	154	69	55.2	8.39	84
JULY	136	45	66.9	9.14	201	65	67.7	13.67	172
AUG.	123	61	50.4	5.18	434	74	82.9	30.10	56
SEPT.	225	77	65.8	11.23	202	44	78.2	11.99	16
OCT.	65	37	43.1	2.81	190	88	53.7	10.22	-
NOV.	210	32	84.8	20.76	174	58	66.7	13.53	-
DEC.	190	80	57.9	12.52	110	82	25.4	3.19	-
TOTAL	-	-	-	94.62	-	-		150.16	368
AVG.	141	70	50.1	7.89	200	69	60.3	12.51	31

### COMMENTS

For 1967 the following factors must be considered. The average daily flow increased by 14.4%. The average influent BOD decreased by 10%. The average influent SS increased by 10%. The flow to the old aeration section remained constant (0.16 mgd).

As a result of these factors the overall percent removal of BOD and SS decreased to 50.1% and 60.3% respectively. This is comparable with the results obtained from a primary treatment plant without an aeration section.

The amount of grit removed was reduced from 63 cubic feet per month to 31 cubic feet per month.

## AERATION SECTION

MONTH	PRIM. EFFL B.O.D. PPM.	M.L.S.S. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	192	1617	25	1000
FEBRUARY	88	1670	11	2500
MARCH	60.7	1582	8	4444
APRIL	79	1310	12	2687
MAY	131	1645	16	1463
JUNE	97	1768	12	1967
JULY	67	1174	12	2857
AUGUST	76	1227	12	2500
SEPTEMBER	132	1359	21	1500
OCTOBER	54	1340	8	3790
NOVEMBER	140	1084	27	1313
DECEMBER	155	-	-	-
TOTAL	-	-	-	-
AVERAGE	106	1434	15	2366

## COMMENTS

Approximately 24.3% of the total flow is treated in the aeration section.

### DIGESTER OPERATION

Month	Sludge to Digester Gallons	Sludge from Digester Gallons
January	53,800	23,000
February	50,400	23,000
March	55,800	23,000
April	54,000	23,000
May	55,800	23,000
June	54,000	25,300
July	55,800	23,000
August	56,000	31,000
September	54,200	26,000
October	55,800	37,000
November	54,000	35,000
December	54,000	39,000
Total	653,600	331,000
Average	54,467	27,583

### COMMENTS

The digester was unheated and roofless. It was used as a thickening tank and as such it was effective giving a 50% reduction in solids volume.

Due to expansion of the plant this digester is now removed from service and replaced by a large tank. The thickened sludge is removed by tank truck.

## CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	18.398	1169	6.35
FEBRUARY	16.817	1115	6.63
MARCH	21.672	1102	5.08
APRIL	26.638	1250	4.69
MAY	19.221	1321	6.97
JUNE	19.751	1090	5.52
JULY	20.098	1130	5.62
AUGUST	16.721	1162	6.95
SEPTEMBER	15.178	1180	7.77
OCTOBER	20.037	1351	6.74
NOVEMBER	23.333	1308	5.61
DECEMBER	22.754	1408	6.19
TOTAL	240.618	14586	-
AVERAGE	20.052	1216	6.18

## COMMENTS

Due to the high concentration of BOD and SS in the effluent chlorine was fed to the effluent at a rate of 6.18 ppm.

This dosage maintained a 1.0 ppm chlorine residual after 15 minutes contact time.

The bacteria count in the effluent was reduced to minute numbers.



## **CONCLUSIONS**

As in previous years the plant was overloaded and quality of the effluent was poor. However, it is anticipated that the expansion of facilities which began late in 1967 will improve the effluent quality.

## **RECOMMENDATIONS**

It is recommended that application be made by the municipality for the expansion of treatment facilities before the need for such facilities becomes critical.



